
Feedback on the SCAR 4th Foresight exercise
“Sustainable Agriculture, Forestry and Fisheries in the Bioeconomy - A
Challenge for Europe – Draft May 15th, 2015”

June 11, 2015

For many years, the livestock sector has been questioned in Europe for its greenhouse gas emissions, its inefficient use of resources and the idea that diets less rich in animal products are better for health. This is again the case in the SCAR foresight report. This conflicts with the huge increased demand for animal product that requires an increase in production. The discrepancy reflects the fact that many of the opinions criticizing animal production and animal based foods do not represent the consumers' demands but the view of some NGOs and the press organs. The European animal production sector is also a major part of our economy: it contributes €130bn annually to Europe's economy, accounts for 48% of total agricultural activity and creates employment for almost 30 million people. At the same time, the NRC and several US Academies (Science, Medicine)¹ has proposed that the financing of animal production research should be increased to respond to the rising world demand through exportation of their products but also their vision of the production methods and know-how of North America. Europe cannot ignore these realities, and we need to be pragmatic and to avoid too simplistic visions. Reducing the assessment of livestock sector to one ratio of energy utilization (as it was done in the report), ignores a far more complex reality. In particular, the animal production sector contributes to food and nutrition security, and an efficient European bio-economy can only be built on well controlled ecological cycles in which the animal holds a key role.

Feed versus food

Must we reduce our consumption of animal products in Europe to move towards a more sustainable development of the planet?

The document suggests a reduction of the consumption of animal products to move towards a more sustainable development of the planet. We obviously can reduce our meat and dairy product consumption in European countries with neither harm nor benefit on our health but this will have only a marginal effect compared to the increase in global demand. FAO data (2010) show that of the 286 million tons of meat consumed in the world, Asia accounts for 46%, the EU-27 for 17% and North America for 15%. Yet per capita consumption is low in Asia compared to Europe (about 30 kg vs. 80 kg). A 30% reduction of our consumption in Europe (which will bring us to the level of the 1970's) will only have fairly moderate effects compared to the expected increase in world consumption. We agree that this will give a signal but indeed consumption of red meat is currently eroding in European countries, the reduction being primarily related to the decrease in purchasing power.

Can we easily replace protein of animal origin by protein of plant origin?

It is possible to shift a small part of the protein of animal origin to protein of plant origin in Western diets, but there are no real alternatives to animal protein. The reasoning that led to an easy ideology of a planet that will access sustainable development through drastic reduction in the consumption of animal products is not realistic.

¹ National Academy Of Sciences, National Academy Of Engineering, Institute Of Medicine, National Research Council 2015. : Critical Role of Animal Science Research in Food Security and Sustainability

- The biological value of animal proteins for human nutrition (digestibility, amino acid profile) is much higher than that of protein of plant origin. The score of animal protein (expressed as the ratio between the digestible content of the most limiting AA in 1 g of animal protein versus the concentration of this AA in the reference protein corresponding to human need) is 40% higher for milk and bovine meat and 25% higher for pig, poultry meat and eggs. This means that we need to eat at least 25% more protein of plant origin to cover our needs. This explains why the C footprint of vegetarian diets is not lower than that of classical diets because vegetarians need to eat more food (DUALINE, INRA scientific collective expertise 2011).
- Protein from poultry origin today has unparalleled opportunity costs, whereas removing the soy proteins is very expensive. The "Isolated Soy Protein" has a lower nutritional value than caseins and caseinates from dairy products. We will probably have the same technological difficulties with other sources of plant protein.
- Finally protein of animal origin is a prerequisite for a healthy European human population, it is an essential part of European cultural heritage and it contributes to the taste and sensory characteristics in all world cuisines and is an essential part of European cultural heritage. Eating habits are very diverse and difficult to change, but this is largely ignored in the SCAR foresight report.

Animal in competition with human

Animals consume 75 to 80 % of the plant biomass produced in Europe and thus can be considered in competition with human food production. Nonetheless, two thirds of this biomass are forages (mainly grassland) that are not edible for human nutrition, and grassland should be maintained because it provides a wide range of well recognized ecosystem services. The rest (one third) is used to produce concentrate feeds, but again a part of these feeds are by-products of crops (cake oil mills, pulp from beet pulps, wheat bran and other milling by-products, etc.) not digestible by humans and grains unsuitable for grain markets (e.g., those with low protein content). The remaining part is genuinely in competition with human food, and it is clear that this part should be reduced to the minimum in the future.

Efficiency of animal production

The efficiency of livestock production is considered to be low. Basically, this reflects the fact that animals are secondary processors, but we must remain cautious about the cliché that animal production will always be less interesting than the crops. Indeed efficiency of production system is a rather complex matter and the sources of variation are huge. Again the reality needs to be qualified more precisely before asserting some apparent truths.

- The document pointed out a ratio of 15 kcal to produce one kcal of animal product without giving a precise definition of what this value includes. Other estimation from the FAO claimed that 1 kg of red meat requires 7 kg of cereals to be produced. This figure corresponds to very intensive systems during the final months of fattening, but for example in France the average amount of grain per kg of beef is similar to that which is needed to make 1 kg of pork or chicken. Regardless, all these energy ratios do not take account the energy content of manure that should at least be considered to its equivalent in term of mineral fertilizers (the production of 1 kg N of mineral fertilizer require approximately 60 MJ).
- Animal production is often considered as inefficient with regard to protein utilization. Global estimations give a mean value of 4.9 kg of plant protein to produce one kg of animal protein, with the ratio ranging from less than 3 for poultry to 9.5 for bovine meat. But if we consider the edible protein (i.e., plant protein that can be used directly by humans), the values are lower because animals, especially ruminants, can valorize non-edible protein. The ratio drops to 2.6 for poultry and 0.9 for beef meat produced with a significant proportion of grass in the diet and 0.7 for grass-based milk (or even 0.1 in fully grassland based production system as in

Irish dairy systems) but still remains around 3.0 in Intensive feedlot systems with confinement fed cattle.

Others outputs from animal production systems

Evaluating animal production system through the prism of feed/food ratio is very restrictive. European livestock sector is inextricably linked to the vitality of territories and provides a lot of different ecosystem services that are ignored in the document. Reducing animal product consumption and animal production will also reduce the provision of those services. The livestock sector contributes to soil fertility, and to maintain open and diverse landscapes appreciated for tourism activity. It also provides skins for further processing in the clothing and furniture industry. The livestock sector thus generates jobs on farms, in agro-food industries and other industries and trade. Most of these jobs are not located in large cities, but are contributing directly to the vitality of our territories. Indeed, all these services are poorly evaluated and not deeply studied to date.

Livestock sector as part of the bio-economy

Livestock production has a major role to play in regulating the ecological cycles

Livestock production recycles biomass not directly usable for human food to produce food of high nutritional quality, and is a strong engine for the N, P and C cycles, which in turn contribute to the production of biomass. Livestock contributes to the management of biodiversity as well.

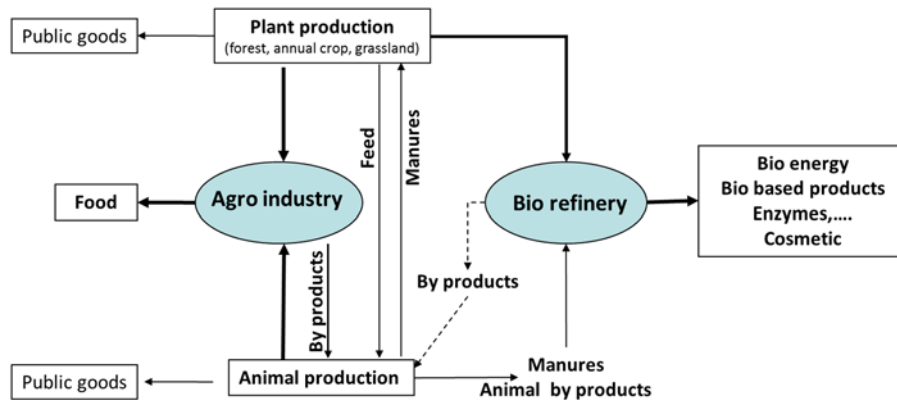
- Animals consume almost all by-products of crops and grains that are not suitable for grain markets (e.g., those with a low protein content)
- The manure should be considered as a resource, representing 10.3 million tons of nitrogen versus 10.5 million tons of synthetic N fertilizers. At world level, they also represent 17 million t P that is more than the amount of P supply on the soil with mineral fertilizers (14 million t / year). The substitution of mineral fertilizers by effluents and manure could be further improved. The current trend towards specialization of farms and indeed geographical specialization in either livestock or crops are barriers to optimal use of the N and P effluent.
- Grassland, including permanent grassland, and effluent spreading (especially solid manure and compost), contribute to the management of OM and promote soil carbon storage, which in turn is favorable for the sustainability of plant production.
- The livestock systems also contribute to the maintenance of biodiversity through 65 million ha of permanent grassland (FAOstat), 17 million ha of rangeland and 10 million ha of sown grassland (totaling 48% of EU-27 UAA) in 2007. These areas and associated structures (field edge, hedges, ditches, etc.) are a source of specific, genetic and functional biodiversity and provide habitats for wildlife.

Animal production systems are a part of a generalized sustainable bio-economy (Figure 1)

Apart from its contribution to the regulation of ecological cycles, animal production can contribute to the bio-economy in different ways. None of the following aspects are mentioned in the SCAR 4th Foresight exercise:

- Valuation of new resources such as by-products or wastes from agro industry or bio refineries by converting them into animal products. This may require the development of new technologies to secure these by-products.
- Bio-refinery of animal by-products such as (i) manure by extracting organic compounds of interest, then extracting nutrients (N and P) and finally producing energy through anaerobic digestion; and (ii) animal by-products (wastes from slaughterhouse, hatcheries, dairy industries);
- Valuation of protein for non-food use, development of antimicrobial properties of bone and eggs etc. There is a role for innovations in developing new techniques.

Figure 1: Animal production as part of a generalised bioeconomy



Conclusion

This paper draws attention to the complexity of the global role of animal production in the food and nutrition system, in the bio-economy and more generally in European societies. Consequently, it stresses that we need to be more pragmatic and take weighted decisions to increase the synergies between sectors. We are now facing increased demand for biomass for diverse new uses, and hence we must look for synergies between sectors without opposing them. Obviously at the same time, the livestock production sector must improve its practices to increase resource efficiency, to close the loops to mitigate GHG emissions and minimise adverse effects on the environment.